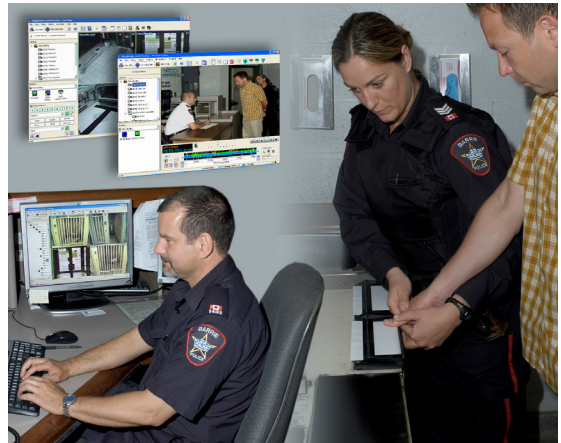


IP Video - CCTV Solutions for Law Enforcement

Oliver Vellacott, CEO of IndigoVision, describes how IP Video is addressing the surveillance needs of Law Enforcement and Criminal Justice systems.

The security issues facing law enforcement and criminal justice systems are many and complex. A site-wide surveillance system is therefore an essential tool to monitor prisoner and staff safety, record incidents, protect property, detect criminal activity, combat terrorism and provide evidence. Police stations and courts are difficult premises to monitor, mixing high-security and public areas in the same building. Conversely, monitoring of urban areas and traffic enforcement create a different set of problems. In all these environments it's important that different operators have access to the same CCTV images, no matter where they are located. This demands a flexible and truly distributed CCTV system that delivers the very highest quality video.



Security Threats and Challenges

Law enforcement and criminal justice systems face a myriad of threats and challenges:

Geography - Sites often cover large geographic areas, particularly for municipal monitoring.

Environment - Buildings often include both high-security and public areas together.

Terrorism - Police and court buildings are prime targets for terrorists.

Evidence - Video evidence of criminal activity and police interviews needs to be very high quality and tamper-proof to aid convictions.

Safety - High profile events all too often seen in the media highlight the importance of safety for staff, prisoners and the public.

IP Video

IP Video is the control and recording of live digital CCTV images over IP-based networks such as an IT Local Area Network (LAN) as found in most organizations. Transmitter/receiver modules, either standalone or built into IP cameras, convert the camera signal into high-quality MPEG-4 or H.264 format digital video for transmission over the network. Operators using workstations running Security Management Software (SMS) can view live and recorded video from any camera. The very best IP Video systems are truly distributed, which allows any component (camera, SMS workstation or video recorder) to be located at any point on the IP-network. This makes the system extremely flexible and scalable.

Video is recorded directly from the network using Network Video Recorders (NVRs), which can be distributed around the network to minimize the bandwidth usage and create a fault tolerant solution by removing the single point of failure associated with analog/DVR systems.

The SMS will also provide advanced video search and analysis tools, analytics, alarm handling features and site map overlays for easy identification of cameras and alarms. Some IP Video manufacturers provide their SMS license-free within the cost of the hardware, allowing workstations to be deployed throughout a site for no additional cost.

Any analog CCTV camera can be connected to the network using transmitter/receiver modules. Most manufactures also supply a range of high-end IP cameras that can be connected directly to the network and are available in a number of resolutions including high-definition (HD). Leading HD IP Cameras can be used on standard networks and storage, bringing the benefits of high-definition video to everyday CCTV surveillance applications. High-fidelity two-way, fully synchronized audio can also be transmitted and recorded alongside the video.



SMS workstations can be located anywhere on the IP network, including the desk of law enforcement officials.

Police Stations, Detention Centers & Court Buildings

Monitoring buildings involved with law enforcement creates a challenging environment. Not only does CCTV have to monitor prisoner security and safety but also staff and public safety and building security, both interior and perimeter.

An IP Video system can deliver the highest quality video at full frame rate and provide standard onboard analytics for real-time analysis of image content.

The SMS adds other dimensions to the surveillance operation by providing advanced analytical search tools and features such as instant recall of recorded video. In addition, the distributed nature of IP Video technology allows any component in the system to be located anywhere on the network. For example, in a police station CCTV workstations could be used by:

- Booking in Desk
- Custody Sergeant
- Senior Police Officers
- Interviewing Officers and Detectives



Grand Prairie Police Department, Texas, has transformed the way it uses CCTV after installing a complete integrated IP Video solution.

This gives the police and the courts the flexibility to easily and cost-effectively integrate CCTV surveillance into their operations.

Safe Rooms

Many police departments are replacing uneconomic remote police stations with unmanned 'safe rooms', which allow the public to contact the police from a safe and secure environment. An IP Video solution can implement all the necessary two-way video and audio intercom facilities entirely through the network. The advanced compression technology available on leading IP Video systems allows high-quality video and audio to be transmitted over very long distances with minimal delay.

Remote Monitoring & Wide-Area Surveillance

Law enforcement around the world has to increasingly monitor city centers and local communities as part of their operations. Whether this is to monitor criminal activity or manage traffic, remote monitoring creates a challenging environment for CCTV systems. IP Video's flexible and scalable technology is ideally suited to this type of application.

The very best IP Video solutions employ MPEG-4 and H.264 compression technology that allows DVD-quality video to be transmitted across standard IP networks over large distances with minimal bandwidth requirements. This ensures latency is kept to a minimum, which allows PTZ cameras to be controlled smoothly from far away, and wireless networks to be deployed easily to overcome the cabling problems associated with wide-area applications.

Mobile Applications

IP Video solutions have been deployed in a number of mobile applications including CCTV monitoring vans and command vehicles. Special robust, fault-tolerant NVRs with removable hard discs have been developed for mobile applications. This coupled with excellent compression, low storage requirements and easy wireless network implementation means that IP Video is the ideal solution for mobile and rapid deployment CCTV applications.

Multi-Agency Access

In large remote monitoring applications it is common for many different law enforcement agencies to want access to CCTV video footage. However, the video each agency requires may be different, and certain cameras need to be viewed only by specific agencies. A typical application would be an airport where the following agencies and departments would require access to the CCTV system: police, immigration, customs, airport security, airport operations and baggage handling.

In order to manage this complex environment the SMS implements sophisticated Identity Authentication Management (IAM). The IAM system manages all aspects of user accounts and access permissions and creates logs to ensure a secure audit trail is produced.

System Features

IP Video solutions are feature rich and many have been developed specifically for law enforcement applications.

Privacy Zones

Privacy Zones is a unique solution to the problem of implementing CCTV Hidden Zones without permanently losing the video which may be needed for evidential purposes in the future. Traditionally, Hidden Zones have been crudely implemented by applying a permanent mask to the front of the camera. The Privacy Zones feature blocks out areas of video to avoid viewing data/images that are irrelevant or intrusive.

Analytics

IP Video solutions typically provide a wide range of analytics features that run in real time in the camera and in the SMS for post-event analysis. Analytics can be used to detect movement or actions in a scene and then automatically generate alarms, warning the operator or triggering a system action such as start recording or pan a camera.



The Privacy Zones feature blocks out areas of video to avoid viewing images that are irrelevant or intrusive, but without permanently losing the video.

Analytics can include virtual tripwire, motion detection, abandoned object detection and tracking, congestion detection and counter flow. For example the 'Hooded Camera' analytics feature, which automatically alerts the system when a camera lens is obscured, is being used within many law enforcement applications.

Integration

Leading IP Video solutions can be fully integrated with other security systems such as access control and perimeter protection and can consolidate all alarms from these systems within the SMS. In addition their extensive integration facilities allow easy interfacing with systems such as Cell Call, Life Signal, Intercom and Interview recording equipment.

High-Quality Video and Audio

The best IP Cameras and transmitter/receiver units can transmit DVD quality video at 25/30 fps and hi-fi quality two-way audio with a guarantee that no frames will be dropped. The video and audio is fully synchronized, which makes it an ideal platform for recording interviews and other evidential material. Watermarked and tamperproof evidential video/audio clips can be exported from the system, together with a standalone player for remote viewing.

Incident Lockout

In the event of an incident a senior operator can log into a SMS workstation with the appropriate permissions and lock down a specific camera or the entire CCTV system. The cameras can then only be viewed and controlled from that workstation.

Video Viewing Notification

A digital output from the IP Cameras and transmitter/receiver units can be triggered whenever the camera is being viewed or recorded. This can be used to drive a red light in an interview room to indicate the camera is operational.



About the Author

Oliver Vellacott founded IndigoVision in 1994. He was previously a product manager with a background in intelligent camera products. Oliver studied piano at the Guildhall School of Music before gaining his first degree in Software Engineering from Imperial College London and then a PhD in Electrical Engineering from Edinburgh University.

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